

Section 5.2

Log Rule for Integration: Let u be a differentiable function of x .

1. $\int \frac{1}{x} dx = \ln|x| + C$

2. $\int \frac{1}{u} du = \ln|u| + C$

1) Find $\int \frac{3}{x} dx$.

2) Find $\int \frac{1}{5x+2} dx$

3) Find the area of the region bounded by the graph of $y = \frac{2x^2}{(x^3+3)}$, the x -axis, and the line $x = 2$.

4) Find the following:

a) $\int \frac{2x+3}{x^2+3x} dx$

b) $\int \frac{-\csc^2 x}{\cot x} dx$

c) $\int \frac{6x^2+4}{x^3+2x} dx$

5) Find $\int \frac{2x^2-3x+6}{x^2+3} dx$

6) Find $\int \frac{5x}{(x+2)^3} dx$

7) Solve the differential equation $\frac{dy}{dx} = \frac{1}{\sqrt{x}(\sqrt{x}+2)}$.

8) Find $\int \cot x dx$

9) Find $\int \csc x dx$

10) Evaluate $\int_{\pi/6}^{\pi/2} \sqrt{1 - \cos^2 x} dx$

11) Find the average value of $f(x) = \cot x$ on the interval $\left[\frac{\pi}{4}, \frac{3\pi}{4}\right]$.